



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/770,769	01/25/2001	Avishai Keren	150824.02	7768
22971	7590	06/07/2007	EXAMINER	
MICROSOFT CORPORATION ONE MICROSOFT WAY REDMOND, WA 98052-6399			VAN HANDEL, MICHAEL P	
		ART UNIT	PAPER NUMBER	
		2623		
		NOTIFICATION DATE	DELIVERY MODE	
		06/07/2007	ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

roks@microsoft.com
ntovar@microsoft.com
a-rydore@microsoft.com

Office Action Summary	Application No.	Applicant(s)	
	09/770,769	KEREN ET AL.	
	Examiner Michael Van Handel	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 19 March 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 17-21,23 and 45-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 17-21, 23, 45-47 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date: _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This action is responsive to an Amendment filed 3/19/2007. Claims **17-21, 23, 45-47** are pending. Claims **17, 20, 45** are amended. Claims **1-16, 22, 24-44** are canceled.

Response to Arguments

1. Applicant's arguments regarding claims **17-21, 23, and 45-47**, filed 3/19/2007, have been fully considered, but they are not persuasive.

Regarding claims **17, 20, and 45**, the applicant argues that Richardson does not disclose or suggest selecting the corresponding modified display elements by the analysis module including (1) referring to a plurality of modifiable parameters that trade image quality and bandwidth with each of these modifiable parameters having a range in which image quality is minimally degraded and a range in which image quality is significantly degraded, or (2) selecting the modified display elements based on the plurality of modifiable parameters so that image quality is minimally degraded based on the transmission bandwidth limitations. The examiner respectfully disagrees. As mentioned in the Office Action mailed 12/18/2006, Richardson discloses a technique for updating a framebuffer. The endpoint where changes to the framebuffer originate is known as the VNC server. Changing from one framebuffer state to another is referred to as an update. These updates are created by and sent from the server to the client. The pixel data of the update is divided into a series of rectangles (p. 35).

Richardson also teaches varying the desktop size, pixel format, and encoding schemes for the client-server connection. The examiner notes that changes in any of these represent a tradeoff between image quality and bandwidth. Richardson further teaches that the server chooses the encoding scheme most appropriate for a particular screen content being transmitted and the available network bandwidth. This meets the limitation of “wherein selecting the corresponding modified display elements includes referring to a plurality of modifiable parameters that trade image quality and bandwidth with each of these modifiable parameters having a range in which image quality is minimally degraded and a range in which image quality is significantly degraded,” as currently claimed. Richardson still further discloses that the update protocol is demand-driven by client input events, giving the protocol an adaptive quality. On a fast network, for example, as the user drags a window across the screen it will move smoothly, being drawn at all the intermediate positions. On a slower link – for example, over a modem – the client will request updates less frequently, and the window will appear at fewer of these positions. Copy-rectangle encoding is used when a client already has the same pixel data elsewhere in its framebuffer, because it saves bandwidth and is likely to be faster than sending raw data again (p. 35). Since sending data faster allows a greater rate of updates and a smoother client display, the use of alternative encoding schemes based on available bandwidth results in better image quality for a given bandwidth. This meets the limitation of “selecting the modified display elements based on the plurality of modifiable parameters so that image quality is minimally degraded based on the transmission bandwidth limitations,” as currently claimed.

Regarding claims 18, 19, 21, 23, 46, and 47, the applicant argues that Richardson fails to disclose or suggest that the predefined set of display elements include one or more of

backgrounds, icons, buttons, menus, or fonts or that differences between the predefined display elements and the original display elements include color, spatial frequency, spectrum, size, contrast, or type. The examiner respectfully disagrees. Richardson discloses an encoding scheme that takes advantage of the fact that a typical desktop has large areas of solid color and text. The encoding scheme describes rectangles consisting of one majority (background) color and “sub-rectangles” of different colors. A pixel-data caching scheme efficiently encodes multiple occurrences of the same text character by referring to the first occurrence. This meets the limitation that “the set of display elements stored include one or more backgrounds, icons, buttons, menus, or fonts,” as currently claimed and that “the set of predefined display elements stored differ from the original display elements by one or more of color, spatial frequency spectrum, size, contrast, or type,” as currently claimed (the examiner notes that the USPTO considers the applicant's “one or more” language to be anticipated by any reference containing any of the subsequent corresponding elements).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 17-21, 23, 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams, Jr. (US 6,202,211) in view of Richardson et al.

Referring to claims 17, 20, and 45, the claimed “remote computing server system that includes a server that provides remote client access to one or more programs that are run at the server, remotely from one or more client systems, and wherein the server converts display commands generated from the one or more programs into compressed video streams” is met as follows:

- The claimed “server, executing a plurality of programs, each of which generates a set of display commands which represent original display elements of a user interface for each of said plurality of programs” is met by Williams, wherein he teaches a server, which maintains multiple active desktops and applications for display at remotely located STB/TV combinations [col. 3, lines 31-46].
- The claimed “identifying limitations of the client including a compression required by the client, display characteristics of the remote client device, or both” is not expressly disclosed by Williams; however, the Richardson reference teaches using different encoding techniques dependent on the capabilities of the client and the connection between the server and the client. The examiner further notes that the client can request to not be sent data encoded in copy-rectangle encoding, because the client cannot easily read back from its framebuffer. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify Williams to include using different encoding techniques dependent on the capabilities of the client, such as that taught by Richardson in order to allow for more efficient bandwidth usage.

- The claimed “analysis module for comparing the original display elements with a set of predefined display elements stored at the server, wherein responsive to transmission bandwidth limitations that are identified by the server, the analysis module selects corresponding modified display elements from the set of predefined display elements that are most similar to one or more of the original display elements, the set of predefined elements compiled to simplify compression in accordance with said transmission bandwidth limitations, wherein the display elements comprise graphical primitives” is not expressly disclosed by Williams; however, the Richardson reference teaches different encoding techniques, which are used for various video encoding schemes for rendering desktops and other applications generated at a server on a display of a client. Richardson teaches that a connection speed (connection capability) is analyzed and an encoding scheme is chosen based on the capability of the connection from server to client. Changes to the framebuffer originate at the VNC server. When an update is required, the update affects only a small area of the framebuffer. Each rectangle is encoded using a different scheme. The server chooses the encoding most appropriate for the particular screen content being transmitted and the available network bandwidth. All screen changes since the last request are coalesced into a single update. Richardson further teaches copy-rectangle encoding, which copies portions of the video signal instead of using raw data signal, in order to conserve bandwidth. If the client already has the same pixel data elsewhere in its framebuffer, the encoding on the wire is simply an x, y

coordinate, which gives the client a position in the framebuffer from which it can copy the rectangle of pixel data. Thus, if a user were to move a window across a screen and an update were requested, the server would choose copy-rectangle encoding for the particular rectangle. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify Williams to include encoding different rectangles according to different schemes in response to the particular screen content being transmitted and the available network bandwidth, such as that taught by Richardson in order to save bandwidth.

Note: The language "to simplify compression, utilize a pre-compressed display element, or both" is an advantage of the limitation. It is not a further limitation of the claim.

- The claimed "wherein selecting the corresponding modified display elements includes referring to a plurality of modifiable parameters that trade image quality and bandwidth with each of these modifiable parameters having a range in which image quality is minimally degraded and a range in which image quality is significantly degraded, and selecting the modified display elements based on the plurality of modifiable parameters so that image quality is minimally degraded based on the transmission bandwidth limitations" is not specifically disclosed in Williams; however, the Richardson reference teaches varying the desktop size, pixel format, and encoding schemes for the client-server connection (p. 35). The examiner notes that changes in any of these represent a tradeoff between image quality and bandwidth. Richardson further discloses that the server chooses the

encoding most appropriate for a particular screen content being transmitted and the available network bandwidth. The update protocol is demand-driven by client input events, giving the protocol an adaptive quality. On a fast network, for example, as the user drags a window across the screen it will move smoothly, being drawn at all the intermediate positions. On a slower link – for example, over a modem – the client will request updates less frequently, and the window will appear at fewer of these positions. Copy-rectangle encoding is used when a client already has the same pixel data elsewhere in its framebuffer, because it saves bandwidth and is likely to be faster than sending raw data again (p. 35). Since sending data faster allows a greater rate of updates and a smoother client display, the use of alternative encoding schemes based on available bandwidth results in better image quality for a given bandwidth. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify Williams to include varying the desktop size, pixel format, and encoding schemes for the client-server connection, such as that taught by Richardson in order to efficiently transmit data based on server, client, and network capabilities.

- The claimed “video compressor which receives the modified display elements selected above and generates there from a compressed video stream for each one of the plurality of programs” is not specifically disclosed in Williams, though the fact that the video information is multiplexed for delivery [col. 7, lines 13-19] would lead one to incorporate the compression teachings of the Richardson document. Richardson discloses Virtual Network Computing, which transmits

compressed video images to a client. The compression is discussed with regards to the MPEG standard [page 35, **A Single Graphics Primitive**] for compressing and encoding before transmission. It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a compressor to compress the video streams before transmission to the client, in order to allow for more efficient bandwidth usage, while, at the same time, complying with compression standards for transmission.

- The claimed “transmitter for the transmission of the plurality of compressed video streams to one or more remote locations” is not expressly disclosed in Williams, though the fact that the video information is multiplexed for delivery [col. 7, lines 13-19] would lead one to incorporate the compression teachings of the Richardson document. Richardson discloses Virtual Network Computing, which transmits compressed video images to a client. The compression is discussed with regards to the MPEG standard [page 35, **A Single Graphics Primitive**] for compressing and encoding before transmission. It would have been obvious to one of ordinary skill in the art at the time of the invention to transmit compressed video streams to the client, in order to allow for more efficient bandwidth usage, while, at the same time, complying with compression standards for transmission.

Referring to claims 18, 21, and 46, the claimed “set of display elements stored include one or more backgrounds, icons, buttons, menus, or fonts” is not specifically disclosed by Williams; however, Richardson discloses an encoding scheme that takes advantage of the fact that a typical desktop has large areas of solid color and text. The encoding scheme describes

Art Unit: 2623

rectangles consisting of one majority (background) color and “sub-rectangles” of different colors. Richardson further discloses a pixel-data caching scheme that could efficiently encode multiple occurrences of the same text character by referring to the first occurrence. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify Williams to include an encoding scheme that takes advantage of the fact that a desktop has large areas of solid color and text, such as that taught by Richardson in order to allow for more efficient bandwidth usage.

Note: The USPTO considers the applicant's “one or more” language to be anticipated by any reference containing any of the subsequent corresponding elements.

Referring to claims 19, 23, and 47, the claimed “the set of predefined display elements stored differ from the original display elements by one or more color, spatial frequency spectrum, size, contrast, or type” is not specifically disclosed by Williams; however Richardson discloses describing rectangles consisting of a majority (background) color and “sub-rectangles” of different colors as an effective encoding scheme for taking advantage of the fact that a typical desktop has large areas of solid color. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify Williams to include an encoding scheme that takes advantage of the fact that a desktop has large areas of solid color and text, such as that taught by Richardson in order to allow for more efficient bandwidth usage.

Note: The USPTO considers the applicant's “one or more” language to be anticipated by any reference containing any of the subsequent corresponding elements.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Van Handel whose telephone number is 571-272-5968. The examiner can normally be reached on 8:00am-5:30pm Mon.-Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Kelley can be reached on 571-272-7331. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2623

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MVH



SCOTT E. BELIVEAU
PRIMARY PATENT EXAMINER